and nearly equal them; the broad, short, thick though somewhat flattened process representing the horn, very obtuse, or sometimes even retuse at the apex; follicles not seen.

Open hill-tops in south-western New Mexico, about Silver City, flowering in April.

In Dr. Gray's arrangement of the genus in the Syn. Fl. N. Am., this species would come next after *A brachystephana*, Engelm.—Edward Lee Greene.

Notes from Florida.—During a recent visit to Apalachicola, I had the pleasure of rambling for several miles in the vicinity of that ancient town in company with Dr. Chapman, and of being introduced by him to many plants peculiar to this region, first discovered and named by him. Of these, none interested me more than the three Myricaceae which I had not before seen; namely, the willow-like *Leitneria*, the *Myrica cerifera*, var. *intermedia*, which is much more distinct than I supposed, and the *Myrica inodora*. The latter I beheld with less pleasure than mortification, for with it I discovered a mistake in my recently issued Third Fascicle. What I distributed under that name is probably *Myrsine Floridana*. The characters presented by the shrub as found in fruit corresponded so well with those of *Myrica* that I too precipitately named it *Myrica inodora*. The latter, however is quite distinct. Dr. Chapman compared the inflorescence of *Myrsine* to a growth of *Cuscuta compacta*

Most of Dr. Chapman's field work has been done in the neighborhood of the Apalachicola river, a region which embraces wonderfully varied and interesting vegetation. Fortunately the most interesting plants were in bloom at the time of my visit, and I succeeded in preparing fine sets of over thirty species for my fourth Fascicle, including three for my second set of Ferns.

No botanist who travels southward should fail to visit the Apalachicola river. Coming here about the first of April he will find the noble *Torreya* in bloom and beneath it the *Croomia*, which at first I confounded with the young plants of *Dioscorea* and *Smilax herbacea* growing with it. Of the shrubs he will hardly know which to admire most, the yellow variety of *Azalea nudiflora*, the red *Æsculus Pavia*, or the white *Chionanthus*. He will be charmed with the *Silene Drummondii*, and stand with awe before the giant cypresses, gums and cotton woods of the river bottoms. He will be tempted to recline on deep cushions of feathery *Selaginella*, and learn to shrink from that vegetable porcupine, the *Chamaerops Hystrix*. He will marvel at the parrot-beaked *Sarracenia*, and feel repaid for his journey if he sees nothing but the wonderful *Sarracenia Drummondii*.—A. H. Curtiss, *Key West, Fla.*

Double-Staining of Vegetable Tissues.—Having used a number of dyes in double staining vegetable tissues, the conclusion I have arrived at is, that no rules can be given which will ensure success in every case. The process is quite familiar to every working micro-

scopist, but I have been somewhat surprised at the limited number who have fairly succeeded in differentiating the tissues.

In my own experience, I have met with some sections which obstinately refused to act as they should, under the operation of the two colors, but even these, with patient manipulation, can be induced to show some results, even though they may not exhibit that sharpness and purity which it is the aim and object of the mounter to obtain.

I think that a writer in *Science Gossip* has come nearer to the true laws governing the process, than any one who has written on the subject; he has, at least, indicated the direction in which the practical worker must look to attain success. My own theory differs slightly from his, and consequently my process varies somewhat, but in the main it is the same.

It seems to me that the capacity for staining tissues resides more in the colors than in the tissue itself. A stain may be permanent, unless it is driven out. It may be driven out by some solvent, by some bleaching process, or lastly by some other color. Some tissues hold the stain more tenaciously than others, probably on account of their varying density. Thus the spiral and bass-cells will retain a color longer under the influence of a solvent, than the softer and more open parenchymal cells. I endeavor to take advantage of this property, by giving the whole tissue all of one color that it can be induced to take, and then driving it out of the parenchymal tissue by a stronger color, stopping the process at the moment when the second color has completely replaced the first color in the soft tissues, and before it has begun to act upon the more dense cells. If a section be stained with roseine, and then be left long enough in a solution of Nicholson's blue, the whole section will be blue, with no visible trace of red. If it be taken out before the blue has permeated the entire tissue, the red will show, in some parts, quite clear and well-defined among the surrounding blue tissues. Following out this principle, that exact point must be determined when the blue has gone far enough.

In practice I carry out my theory as follows: I use a two-grain, neutral solution of eosin, and in this I preserve my prepared sections until I am ready to use them. They keep perfectly well in this solution, and are always ready to undergo the final process, which requires but a very short time before they can be placed, fully finished, under the covering glass. After taking them from the eosin solution, I pass them through 95 per cent alcohol, merely to wash off the superfluous color, and then place them in a half-grain solution of Nicholson's blue, made neutral. The time required in the blue solution varies with different tissues, and in the nice adjustment of this time, lies the whole success of the operation. I generally spoil three or four sections of each kind in determining the exact time required. I take a section from the eosin, holding it lightly in a pair of forceps, rinse it off rapidly in alcohol, and then immerse it in the blue, still in the forceps, while I count, "with moderate haste," ten. Then quickly place it in clean alcohol, and brush lightly with camel's hair brush. The immersion in clean alcohol seems to check the operation of the blue in-

stantly. I then examine it under a one-inch objective, to determine whether the exact point where the blue and the red remain distinct has been reached. If the blue has not occupied all the softer cells, I take another section, and put it through the same process, counting twelve, and so on, until the proper point is reached; or on the other hand, decreasing the count, if the blue has infringed upon the red in the more dense tissue. Having thus determined the count for the sections of that particular material, I pass the remainder of my sections through the blue into the alcohol, merely counting off the immersion of each section. I then place the sections for a few moments in absolute alcohol, which seems to fix the colors, then through oil of cloves into benzole, and mount in damar and benzole. It is sometimes advisable, with delicate tissues, to merely rinse off the blue in 95 per cent. alcohol and fix the colors in absolute alcohol, but every operator will learn the minor details for himself in the manipulation.

Of course, with the "rule of thumb" method of counting off the time, slight variations will occur, which will mar the beauty of the finished product; besides which minute differences in the thickness of the section will affect the result, and even a distance of a quarter of an inch in the same stem will make a difference in the density of the tissue, which will be obvious in the sharpness of the colors under the objective. So that the operator should not be disappointed if, out of a dozen slides, only four should be worth preserving. The others can go into the borax pot to be cleaned for another operation. However, the beauty of those which do pass inspection, will amply repay for the labor on the spoiled ones. I have perhaps been needlessly minute in the description of the process I have employed, but I have been so often hampered for the lack of minuteness in descriptions of processes by others, which I have been endeavoring to carry out, that I deem it better to err upon the safe side, even at the risk of being considered dry or prosy.

One word as to the use of eosin. I was attracted to it by its exquisite purity of color under transmitted light, and its perfect transparency. I found that sections preserved in its solution, always retained their transparency, and did not become clogged or thick with color, so that when taken out after months of immersion, the most dense cells were no deeper in color than the solution itself So far as regards its hold upon the tissues, it is as strong as roseine, or any of the heavier colors I have ever tried. I cannot testify as to its permanence, but I have some slides that were prepared over a year ago, that appear to be as bright and pure, as when they were mounted. Contrary to the experience of some others, I have not found that the benzole has any bleaching effect, and I have used it with damar, in preference to the usual balsam. Slides prepared with damar, however, should have a thick ring of varnish around them as the damar is brittle, and should not be trusted alone, to hold the covering glass.—W. *in American Microscopical Journal.*

Does Chlorophyll Decompose Carbonic Acid?—The recent memoirs of Pringsheim (Untersuchungen uber das Chlorophyll) sug-